

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

LEE, Young-Pil

The Cheonghwa Bldg., 1571-18 Seocho-dong, Seocho-gu,
Seoul 137-874, Republic of Korea

PCT

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

(PCT Rule 43bis.1)

Date of mailing
(day/month/year) **05 NOVEMBER 2004 (05.11.2004)**

Applicant's or agent's file reference
PH-21692-PCT

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/KR2004/001845

International filing date (day/month/year)
24 JULY 2004 (24.07.2004)

Priority date(day/month/year)
26 JULY 2003 (26.07.2003)

International Patent Classification (IPC) or both national classification and IPC
IPC7 C08F 8/30, C07D 487/22, G01N 30/48

Applicant

POSTECH FOUNDATION et al

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR



Korean Intellectual Property Office
920 Dunsan-dong, Seo-gu, Daejeon 302-701,
Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

LEE, Suk Ju

Telephone No. 82-42-481-8149



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2004/001845

Box No. 1 Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
☐ table(s) related to the sequence listing

b. format of material

- ☐ in written format
☐ in computer readable form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2004/001845

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-23	YES
	Claims	None	NO
Inventive step (IS)	Claims	1-23	YES
	Claims	None	NO
Industrial applicability (IA)	Claims	1-23	YES
	Claims	None	NO

2. Citations and explanations :

Reference is made to the following documents:

D1: WO 02/096553 A2

D2: US 6,365,734 B1

D3: JP 11-217557

I. Novelty and Inventive Step

The present invention relates to a cucurbituril bonded polymer, a cucurbituril derivative-containing copolymer, a stationary phase and a column using the polymer or the copolymer, which are useful for separation and removal of substances.

D1 relates to novel inorganic absorbent composites consisting of an open-pore, solid, and inorganic matrix, comprising cucurbiturils which are chemically linked in the matrix. D2 relates to the composition, methods of preparation and uses novel cucurbituril derivatives having various repeating units and cavities of various sizes. D3 relates to a dye removing agent comprising a cucurbituril precursor as an active ingredient which is a condensate of glycoluril and formaldehyde and substantially does not form a complete cyclic structure.

The subject matter of the present invention differs from the disclosure of D1-D3 mainly in a polymer in which a particle-type polymer with a reactive end -substituted group is linked to a cucurbituril derivative of Formula 1 by a covalent bond; and in a monolithic column obtained by a monomer with a substituted or unsubstituted alkenyl group of C3 - C20 and allyloxycucurbituril of Formula 1.

It cannot be considered obvious to a person skilled in the art, with knowledge of the cited documents, to link polymer with a reactive end -substituted group and cucurbiturils by a covalent bond and a monolithic column obtained by using said polymer.

Therefore, claims 1-23 of the present invention are considered to meet the requirements of Article 33(2) and 33(3).

II. Industrial Applicability

The subject matter of claims 1-23 is considered to be industrially applicable under PCT Article 33(4).